Research Article

Cultural Heritage Perception, Awareness and Pedestrian Density: A Case Study in İzmir

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Abstract

Inspired by the well-known Turkish proverb "Even if we don't visit or see it, that village is still ours", this study explored whether historical buildings in frequently visited and walkable areas are more widely recognized, or if it is possible to identify, appreciate, and preserve historically significant buildings without seeing or passing by them. Specifically, this study investigates the relationship between pedestrian density and cultural heritage perception and awareness in Izmir's historic district. Surveys were conducted with 138 residents to evaluate their knowledge of historical buildings from the Early Republican Period (or their cultural heritage awareness) and how they perceived the aesthetic quality of both the buildings and the streets where they are located. As a walkability indicator, pedestrian density around selected historical buildings was measured via objective and subjective methods. Unobtrusive observations, such as counting the number of people at specific locations during designated time intervals were used to evaluate the actual behaviour (objective measure). Additionally, surveys were employed to understand people's tendency to walk through the streets where these buildings are located (reported behaviour / subjective measure). The results show that streets surrounding well-preserved and aesthetically prominent buildings are preferred more often by pedestrians; or vice a versa. Results also confirm that increased pedestrian density is associated with a greater awareness of cultural heritage sites. Furthermore, aesthetically appealing streets are considered more suitable for recreational walking. These findings highlight the value of walkable spaces in urban planning and cultural heritage conservation, as pedestrian experience can boost awareness of cultural heritage.

Keywords: Cultural Heritage Awareness, İzmir, Pedestrian Density, Walkability.

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Araştırma Makalesi

Kültürel Mirasa İlişkin Farkındalık, Algı ve Yaya Yoğunluğu: İzmir'de Bir Vaka Çalışması

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Özet

"Gezmesek de görmesek de o köy bizim köyümüzdür" sözünden yola çıkarak, bu çalışmada sıkça ziyaret edilen ve yürünebilir alanlardaki tarihi yapılara ilişkin farkındalığımız daha mı yüksektir yoksa tarihi yapıların yanından geçmesek de görmesek de onların farkında olur, tanır, değerini bilir korur muyuz gibi sorulara cevap aranmıştır. Daha somut ifade etmek gerekirse; bu çalışmada İzmir'in tarihi bölgesindeki tarihi yapıların (ve yapıların yer aldığı sokakların) kullanıcılar tarafından ne derece estetik bulunduğu ve ne derece fark edildiği ile bu sokakların yayalar tarafından ne derece tercih edildiği arasındaki ilişkinin incelenmesi amaçlanmıştır. Seçilen tarihi binaların çevresindeki yaya yoğunluğunun yürünebilirliğin bir göstergesi olduğu varsayılmıştır. Tarihi yapıların çevresindeki yaya yoğunluğu (ve yürünebilirlik) hem nesnel hem öznel yöntemlerle ölçülmüştür. Gerçek yaya yoğunluğunu ölçmek için belirli yerlerden geçen insan sayısı belirli aralıklarda gözlem yoluyla ölçülmüştür. Ayrıca anketler aracılığı ile rapor edilen yaya yoğunluğu bilgisi elde edilmiştir. Bu tarihi yapıları (Erken Cumhuriyet Dönemi'ne ait kültürel mirasları) ne kadar tanıdığı / bildiği ve ne derece estetik bulduğu ise 138 katılımcının dahil olduğu anketlerle değerlendirilmiştir. Sonuçlar, iyi korunmuş ve estetik açıdan öne çıkan binaların çevresindeki sokakların yayalar tarafından daha sık tercih edildiğini; diğer bir deyişle, artan yaya yoğunluğunun kültürel miras alanlarına yönelik farkındalık ile ilişkili olduğunu göstermektedir. Ayrıca, sonuçlar estetik açıdan çekici sokakların, rekreasyon amaçlı yürüyüşler için daha uygun bulunduğuna işaret etmektedir. Bu bulgular, yürünebilir alanların kentsel planlama ve kültürel mirasın korunmasındaki değerini vurgulamakta; yaya deneyiminin, kültürel miras farkındalığını artırabileceğini göstermektedir.

Anahtar Kelimeler: Kültürel Miras Farkındalığı, İzmir, Yaya Yoğunluğu, Yürünebilirlik.

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INTRODUCTION

The growing influence of contemporary architectural and planning practices has led to a decrease in awareness of historical buildings in cultural heritage areas. Rapid urbanization, ineffective preservation policies, plans and strategies have contributed to the deterioration of the traditional urban fabric and the loss of historical identity. General knowledge suggests that, as the original form and function of historical buildings change, public awareness of these buildings' declines, which in return leads to a reduction in cultural heritage areas' attractiveness for pedestrians, especially those walking for recreation. When this mutual chain between cultural heritage and pedestrian behaviour is disrupted, overtime, cultural heritage areas lose their significance, reducing opportunities for citizens to experience them through recreational walking. This raises the question: Is awareness of historical buildings higher in areas with heavy pedestrian traffic and where walking is more popular?

Given that, this study aims to investigate the relationship between pedestrian density and awareness of historical buildings in cultural heritage areas (Izmir's historical city centre district). It is assumed that pedestrian density indicates walkability of an area; the higher the pedestrian density the more walkable the area is.

In recent years, various disciplines, including urban planning, tourism, architecture, and heritage conservation, have explored different strategies to address these challenges. Conservation, renovation, and adaptive reuse of historical buildings and cultural heritage areas have gained increasing attention across these fields. For example, planning studies investigated the impact of modern urbanization on the silhouette of historical environments (Özkaraca Özalp & Halaç, 2023), and explored the renewal and refunctioning of historical areas (Mehanna & Mehanna, 2019). Cultural tourism research addressed various topics, including the identification of cultural routes (Wang & Wong, 2020), and the potential applications of virtual reality, artificial intelligence, and simulation in touristic areas (Bolshakov & Merkuryeva, 2016; J. Lee et al., 2019). In addition, the literature examined topics such as, social awareness of historical heritage (Endere et al., 2018; Shankar & Swamy, 2013), urban memory (Kolsal & Güven Ulusoy, 2022), cultural heritage (Pehlivan et al., 2021) and cultural heritage management (Ulusan, 2022). The literature also explored the connection between cultural and historical heritage sites and tourism by analyzing tourist carrying capacity and spatial density in urban heritage zones (Ding et al., 2023; García-Hernández et al., 2017), the sustainability of these areas (Pizarro-Reyes et al., 2022; Zhenrao et al., 2021), cultural economy (Ernawadi & Putra, 2021; Özdemir, 2009).

In addition, the relation between cultural heritage and awareness is also explored. Some of these studies focused on the influence of social and demographic factors. For example, Nyaupane & Timothy (2009) examined public awareness of heritage buildings in Arizona and found that citizens' awareness of historic sites and preservations vary by their income and education. Similarly, Erbay & Saylam (2018) addressed the unique challenges faced by women in accessing and appreciating historical sites. Other studies focused on the ways that can enhance cultural heritage awareness and suggest that promoting citizens walking around these areas can contribute to increase in awareness. For example, Shimray (2019) addressed the ways to raise awareness for cultural heritage sites, such as incorporating the topic into education, publishing heritage-themed newspapers or organizing heritage festivals, walks. In parallel; Husar et al. (2020) explored how urban walks can enhance public awareness

about cultural heritage and foster public participation in advocating the protection of historic environments.

However, fewer studies have focused on the walkability of cultural heritage areas. Existing research has examined topics such as spatial accessibility for individuals with disabilities (Kejanlı et al., 2023; Marín-Nicolás & Sáez-Pérez, 2022), pedestrian density and spatial access (Jiménez Martín et al., 2022), spatial quality (Li et al., 2024), and the relationship between walkability and elements of the built environment (Barrera-Fernández & Hernández-Escampa, 2019; Belge, 2012; Kerdani et al., 2017; Sheng & Wa Tang, 2011), along with pedestrian behaviour in historic areas and cultural routes (Abdel-Hadi et al., 2009; Maniei et al., 2024). These studies underscore the importance of this research. The lack of similar studies involving a Turkish sample adds to the originality of this work. While research in developed countries tends to highlight the role of space quality in walking decisions, in Türkiye, walking is often driven by economic necessity, as many cannot afford alternative transportation modes (Çubukçu, 2019). Consequently, the effect of environmental quality on walking behaviour is less pronounced, potentially weakening the connection between pedestrian density and awareness of historical sites. In other words, findings from developed countries may not fully apply to Türkiye's unique social and physical context. This study seeks to explore whether the level of pedestrian density can enhance awareness of an area's historical value in Izmir.

Although not specifically in the context of historical sites, some works have been evaluating preferability of streets by pedestrians and walkability at different scales (street segment, neighbourhood, city). A significant number of these resources are aimed at identifying the parameters that describe walkability of a place (Çubukcu, 2013; Çubukçu, 2019; Ewing et al., 2005; Ewing & Handy, 2009; Forsyth, 2015; Forsyth et al., 2010; Frank et al., 2021; Lo, 2009; Southworth, 2005; Spoon et al., 2005; Zhou et al., 2019). A variety of parameters are listed for different types of walking (transportation, recreational, exercise). Considerable number of studies focus on walking for transportation (Alfonzo, 2005; Campisi et al., 2021; Cao et al., 2006; Deka et al., 2018; Ferrer et al., 2015; Koohsari et al., 2018; S. Lee et al., 2020; McIlroy et al., 2020; Pikora et al., 2006; Saelens, Sallis, & Frank, 2003; Shatu & Yigitcanlar, 2018; Tarek et al., 2021; H. Wang & Yang, 2019). Specifically, a growing trend regarding walking for transportation can be categorized around New Urbanism (Cysek-Pawlak & Pabich, 2021), sustainability (Zainol et al., 2014), spatial accessibility (Gargiulo et al., 2019; Wali et al., 2024), 15-min city (Teixeira et al., 2024), net zero cities (Gündel & Velibeyoğlu, 2020; Lewis, 2015; Nieuwenhuijsen, 2020). Additionally, some works focus on walking for exercise in different regards such as obesity, elderliness, and socioeconomic status (Cetintahra, 2015; Çubukçu, 2014; Cubukcu et al., 2015; Lachowycz & Jones, 2014; Lehman et al., 2007; Saelens et al., 2003; Xu, 2019). Studies concerning recreational walking (Ball et al., 2001; Beenackers et al., 2014; Bunds et al., 2019; Cheng et al., 2019; Christian et al., 2017; Davies et al., 2012; Gidlow et al., 2019; Ma et al., 2021; Sugiyama et al., 2014, 2015) are limited compared to walking for transportation and exercise. Given that, this study focuses on recreational walking in historical areas. The literature on recreational walks in historical areas is quite limited and only discusses aesthetics (Lomadze, 2024), comfort (Basu et al., 2023), safety and security (Abdulla et al., 2017; Guo & Loo, 2013; Zainol et al., 2016) as separate issues and none explores actual pedestrian behaviour.

The act of walking is defined as a daily practice that occurs within the context of the socio-spatial environment. Urban space is continually reproduced through the behaviours and interactions in daily life (Avar Arslan, 2009; Cihanger Ribeiro,

2019). Walking engages in all the senses and serves as a fundamental means to explore, comprehend, and connect with the city, shaping the perception of urban space (Bassett, 2004; Middleton, 2010, 2018; Wunderlich, 2008). In this perspective, pioneers such as Engels, George Simmel, Jan Gehl and Jane Jacobs have emphasised that cities can be recognised through walking practice, that cities increase social interactions and allow people to use streets as public spaces more effectively (Gehl, 2010; Appleyard, 2021; Jacobs, 1961; Wekerle, 2000).

Walter Benjamin held significant discussions on modernism and the perception of urban space and introduced 'flaneur' concept. According to Benjamin, wandering and strolling as a kind of recreational walking is an effective method to experience the urban areas in its fullest sense (Benjamin, 2002; Önen, 2016). It has been observed that when pedestrians are not constrained by time or the need to reach a specific destination, they tend to engage in wandering. The quality of these walks is directly affected by the way pedestrians perceive the environment (Cao et al., 2006; Jacobs, 1961; Traunmuller & Schieck, 2013). In summary, while numerous studies focus on walkability, recreational walking, environmental perception, and awareness of cultural heritage, there is a significant lack of research examining the connection between cultural heritage perception and awareness and pedestrian density. This study seeks to fill that gap.

The research addresses three research questions:
1) How do the quality and aesthetic appeal of historical buildings and the surrounding streets influence people's awareness and perception of these buildings?
2) What is the relationship between perceived and actual pedestrian density, and how do they relate to the awareness and perception of historical buildings?
3) Does higher pedestrian density contribute to increased awareness of historical buildings, and what role does building aesthetics play in this relationship?

This study employs a mixed methodology, integrating perception-based and measurement-based techniques. Actual and perceived pedestrian density is considered as an important walkability indicator. Pedestrian density (or walkability) is assessed from two angles: first, through user perspectives gathered via surveys, and second, through unobtrusive observations of pedestrian counts. Cultural heritage perception and awareness data are gathered via surveys to understand whether well-designed streets around historical sites can encourage people to walk and raise awareness of the area's historical significance.

METHODOLOGY

The main purpose of the study is to focus on the relationship between pedestrian density and the awareness of historical structures. As perceptions and awareness can differ depending on the type of historical structure, this study focuses solely on buildings to eliminate any potential biased variables. Monuments, squares, plaques are excluded from the study as their physical characteristics (such as size) and social attributes (such as meaning and function) may differ from those of historical buildings.

The study focuses on public and civil buildings in Konak, İzmir, as well as the streets where they are located. Konak, İzmir plays a significant role in the history of the Turkish Republic, as it is recognized as the place where the war began and ended. Consequently, the buildings that are considered as good examples of the First National Architecture Movement of the Early Republican Period were

selected as historical structures. Moreover, as the city centre of İzmir, Konak plays a significant role in the daily activities of its citizens and experiences a high volume of pedestrian traffic, making it an ideal site for the research.

Surveys were conducted with residents to understand their cultural heritage awareness and their perceptions of the aesthetic quality of both historical buildings and the streets where these buildings are located. As an indicator of walkability pedestrian density around selected historical buildings was analyzed using both objective and subjective methods. Unobtrusive observations such as counting the number of people at specific locations during designated time intervals were used to evaluate the actual behaviour of pedestrians. Additionally, surveys were employed to understand people's tendency to walk through the streets where these buildings are located (reported behaviour).

To explore the relationship between the variables, a correlation analysis was performed. Given the small sample size (N=15) and the non-parametric nature of the data, Kendall's tau-b correlation coefficient was deemed the most appropriate statistical method. This measure is particularly advantageous for studies with small sample sizes because it accounts for non-normal distributions. It also minimizes the influence of outliers, yielding more robust and reliable results.

Selection of Historical Buildings Representing First National Architecture Movement of the Early Republican Period

First, 43 buildings that are still standing and in use, representing the First National Architecture Movement of the Early Republican Period, were selected from the studies that focus on Republican Period Architecture in İzmir by İnci Kuyulu (2000); Begüm Türkelleri (2004) and İzmir City Encyclopedias (2013).

A building can stand out and be memorable due to its distinct physical characteristics. Since this study focuses on historical buildings, it is important to account for physical features that may influence the awareness of the selected buildings. Next, these 43 buildings were assessed and scored based on their distinctiveness, as shown in Table 1. This evaluation was conducted to control confounding variables that could affect awareness. These variables include façade design, building mass and height, condition, layout and orientation, setback distances, location, landmark recognition, and the presence of advertisements, signage, and billboards. The table below explains the scoring method for each parameter.

For this evaluation, each building is photographed and assessed by a planner (expert) according to the above criteria set. Then for each building, all scores were summed to calculate an overall distinctiveness score, which ranged from 3 to 14. The buildings were then categorized based on their scores: 17 buildings received fewer than 6 points (low distinctiveness), 17 buildings scored between 6 and 10 points (moderate distinctiveness), and 9 buildings had more than 10 points (high distinctiveness). The results revealed common characteristics among the categories:

Buildings with low distinctiveness scores are generally located on the local streets. The facades of these commercial buildings are hidden by billboards and advertisements.

Buildings with moderate distinctiveness scores are generally situated as corner buildings on local streets. They also serve commercial purposes but have facades that are free from billboards, signage, and advertisements.

Buildings with high distinctiveness scores are located on boulevards. Most of them have institutional functions like banks, library, theatre. Their façades are free from billboards, signage, and advertisements. Also, they appear to be better maintained and more effectively preserved than the others.

Table 1. Distinctiveness criteria

Parameters	Related Sub-Criteria	Scoring
Façade Design	Colour Material Organisation of openings Having a balcony, overhang etc. compared with nearby buildings.	0 The building's facade is the same as the other buildings on the street. 1 The building's facade resembles the nearby buildings, yet it has some differences. 2 The building's facade is completely different from the other buildings on the street.
Building Mass	Size (floor area) Form compared with nearby buildings.	0 The building's size and form are the same as the other buildings on the street. 1 The building's size and form resemble the nearby buildings, yet it has some differences. 2 The building's size and form are completely different from the other buildings on the street.
Building Height	The height of the building is compared with nearby buildings.	0 The building is the same height as the other buildings on the street. 1 The building is shorter than the other buildings on the street. 2 The building is higher than the other buildings on the street.
Building Condition	General look (Bad, Average, Good) is compared with the nearby buildings.	0 The building is about to collapse, is in disuse and has cracks and paint problems. 1 The building shows some signs of wear, with minor cracks and maintenance issues. 2 The building is in good condition.
Harmony	Overall consistency of design, materials, size etc in relation to nearby buildings on the street is compared with the nearby buildings	0 The building is so harmonious with the other buildings that it blends in seamlessly 1 The building stands out as distinct
Orientation	The building's positioning / orientation in relation to the street is compared with the nearby buildings	0 The building has the same positioning and orientation as the nearby buildings. 1 The building has a different positioning and orientation than the nearby buildings.
Building Setback	The setback from the street is compared with the nearby buildings	0 The building's setbacks are the same as the nearby buildings. 1 The buildings' setbacks differ from the nearby buildings.
Location	The significance of the street where the building is situated and the number of façades that are visible from the street.	0 The building is on a local street nestled among other structures, rather than being located at a corner. 1 The building is on the arterial road nestled among other structures, rather than being located at a corner. 2 The building is a corner building with two visible sides. 3 The building is a corner building with at least three sides visible from the street.
Landmark	The symbolic value of the building is examined.	0 The building is not recognized as a landmark. 1 The building is recognized as a landmark.
Advertisement, Signs and Billboards	The presence of advertisements and signs that pollute the aesthetic and architectural features of the building is evaluated.	0 More than half of the building's front is made up of billboards, signage, and advertisements, which distort the building's architectural features and visual appeal. 1 Less than half of the building's front is made up of billboards, signage, and advertisements, which distort the building's architectural features and visual appeal. 2 The building's front is free from billboards, signage, and advertisements.

As a next step, from each category, the five most divergent buildings were selected. In order to mitigate the potential impact of other physical and social characteristics on the results, the buildings in the same vicinity were selected (Figure 1, Table 2).

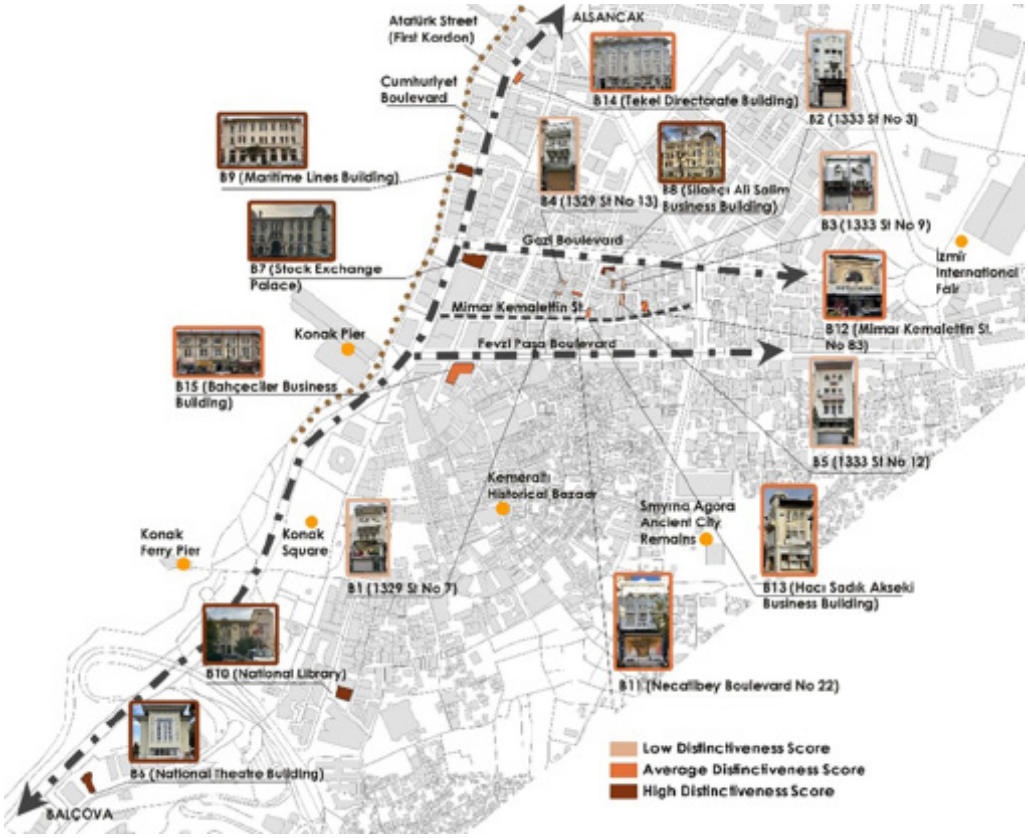
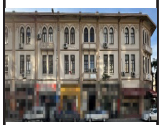
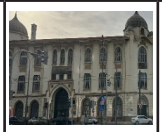
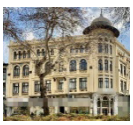
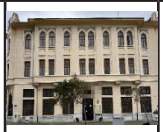


Figure.1 Locations of the selected buildings for the awareness analysis

The common characteristics of the buildings in each group are as follows: All buildings with low distinctiveness level are designated for commercial use and classified as civil structures. In contrast, for moderate distinctiveness buildings; 4 out of 5 are commercial and civil buildings (one of them is a public building). Among the high distinctiveness buildings, 1 out of 5 are commercial and civil buildings (four of them are public buildings).

Table 2. Buildings for the awareness analysis and distinctiveness scores

Low distinctiveness					
Name; score	B1 (1329 St No 7); 3	B2 (1333 St No 3); 3	B3 (1333 St No 9); 3	B4 (1329 St No 13); 4	B5 (1333 St No 12); 4
Moderate distinctiveness					
Name; score	B11 (Necatibey Boulevard No 22); 6	B12 (Mimar Kemalettin Cd No 83); 6	B13 (Hacı Sadık Akseki Business Building);10	B14 (Tekel Directorate Building); 10	B15 (Bahçeciler Business Building); 10
High distinctiveness					
Name; score	B6 (National Theatre Building);11	B7 (Stock Exchange Palace); 12	B8 (Silahçı Ali Salim Business Building);13	B9 (Maritime Lines Building); 14	B10 (National Library); 14
*Building: B , Street Segment: St.					

Survey for Historical Site (Building and Street) Awareness

The survey was conducted online via Google Forms, targeting residents of İzmir. A total of 138 responses were obtained. The survey has three sections. The first section collects demographic information and assesses respondents' familiarity with the area. The second section aims to understand how well the buildings are known by the respondents (awareness of the building). The last section explores the streets that the buildings are located are used by the respondents (walkability).

Pedestrian Density

Pedestrian density was evaluated using two methods—unobtrusive observations, which provide objective measures of actual street walkability, and surveys, which capture subjective evaluations.

Unobtrusive observations were conducted to gather data on pedestrian density. In front of each selected building, two experts counted pedestrians walking in both directions on the same side of the street as the building for a duration of 4 minutes. Since pedestrian density can vary between weekdays and weekends, observations were recorded separately for each. The counts were taken during the same time intervals (09:00-10:00, 10:00-12:00, 12:00-13:30, 13:30-18:00, 18:00-19:00). For buildings on the same street, a 10-minute gap was maintained between observation intervals.

FINDINGS

Participants' Personal Characteristics

Among the respondents, the majority are aged between 24 and 63 years (40.6% were between 44 to 63 years old and 52.9% were between 24 to 43 years old). Younger and older people are less represented in the sample, as only 3.6% were born between 1941 and 1960, and 2.9% were born between 2001 and 2004. The majority of the participants have graduated from a university (1.4% no formal education, 2.9% Primary/Secondary School, 15.9% High School, 60.1% Associate/Bachelor's Degree, and 19.6% Graduate Degree). The sample is almost balanced regarding employment status, with 57.2% employed and 42.8% unemployed.

General and scientific knowledge suggests that education in a design-related field can influence a person's perception and awareness of historic buildings. Therefore, participants were asked whether they have received education in the fields of Architecture, Urban Planning, Landscape Architecture, Interior Architecture, Industrial Design, Conservation and Restoration of Cultural Heritage, Graphic Design, Art and Culture Management, Archaeology, History, and Art History. Only 13.8% of the respondents reported that they have professional knowledge in these domains.

Participants' Familiarity with the Setting

In order to measure familiarity with the area, participants were asked how long they had been living in Izmir. The majority revealed that they have been in İzmir for over 10 years (1 year or less= 6.5%, 2-4 years= 6.5%, 5-9 years= 12.3%, 10 years or more= 74.6%). In addition, participants were asked how frequently they visit Konak. The majority of the participants revealed that they visit Konak once a month (28.3%) or 3-4 times a year (26.8%). As expected, very high and very low familiarity ratings were fewer than moderate familiarity (everyday as they live or work in or around Konak= 10.9%, once a week= 9.4%, once every two weeks=16.7%, once a year= 8.0%).

The participants were also asked about the reasons for visiting Konak. The most popular answers were 'meeting with friends (84)' and 'shopping (81)', while less common responses included 'working in Konak (17)', 'just passing by (6)', and 'exercise (3)'. These results highlight Konak's role as a hub for social and economic activities.

When respondents were asked to describe the locations they most frequently use in and around Konak (including the arrival points, destinations, streets and routes), there were not enough detailed responses to point to a specific location. This finding indicates that participants perceive Konak as a homogeneous area, where nearly all locations are equally preferred by users, with no particular route, destination, or region, noticeably standing out in terms of usage. However, two commonly mentioned locations were; 1) accessing Kemeraltı district from Konak metro station and 2) reaching Cumhuriyet Boulevard from Alsancak İZBAN station. B7 (Stock Exchange Palace), B9 (Maritime Lines Building) and B14 (Tekel Directorate Building) are located on the second route.

The participants were also asked to identify the most preferred streets and areas for walking in and around Konak. Among all participants, 57 respondents did not highlight any specific street, while the remaining 81 respondents pointed to a specific street as the most walkable. The most preferred areas and streets are Kemeraltı, Kordon, Cumhuriyet Boulevard. B7 (Stock Exchange Palace), B9 (Maritime Lines Building), B10 (National Library) and B14 (Tekel Directorate Building) are located in the most preferred areas.

Respondents also described specific features that made these streets appealing for walking. The most frequently mentioned feature was "the existence of historical buildings (50)", followed by landscaped areas (46), attractive shopping area (42), pedestrian-friendly zones (37), attractive architectural characteristics (32), presence of green areas (22), tree-lined streets (20), low traffic density (20), wide pavements (19), variety of colours and forms of buildings along the street (18), existence of street furniture (5). This finding confirms that site selection perfectly aligns with the research objectives.

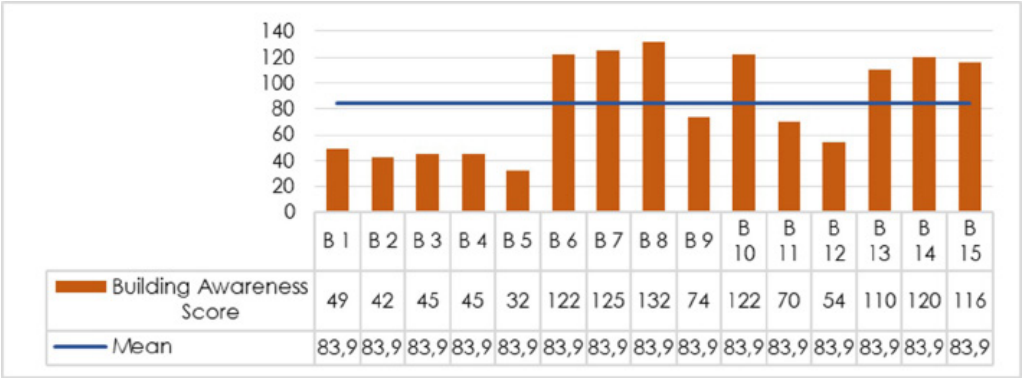
Evaluation of the Perception and Awareness of the Historical Building and Its Vicinity

The second part of the survey collects data on "historical building awareness". The building awareness score is calculated as the sum of the points obtained from the below three questions:

1) The degree of recognition of the building (0= LOW (I do not recognize the building); 1= MODERATE (I recognize the building only visually, I passed by, saw it briefly, remembered it but I cannot describe the location of the building); 2= HIGH (I recognize the building. I can describe the location of the building with the surrounding buildings and street names).
2) Memories or experiences about the building (0= NONE (I do not have any memories or experiences); 1= SOME (I do have some memories or experiences).'
3) Knowledge about architectural style (0= NONE (I do not know), 1= I know the architectural period that the building represents).

The results showed that (Figure 2); B8 (Silahçı Ali Salim Business Building) has the highest awareness score. Then, B7 (Stock Exchange Palace) is the second most well-known building and B10 (National Library), and B6 (National Theatre Building) ranked as third highest awareness score. It is noteworthy that these buildings also have the highest distinctiveness scores, highlighting their significant visual and cognitive impact.

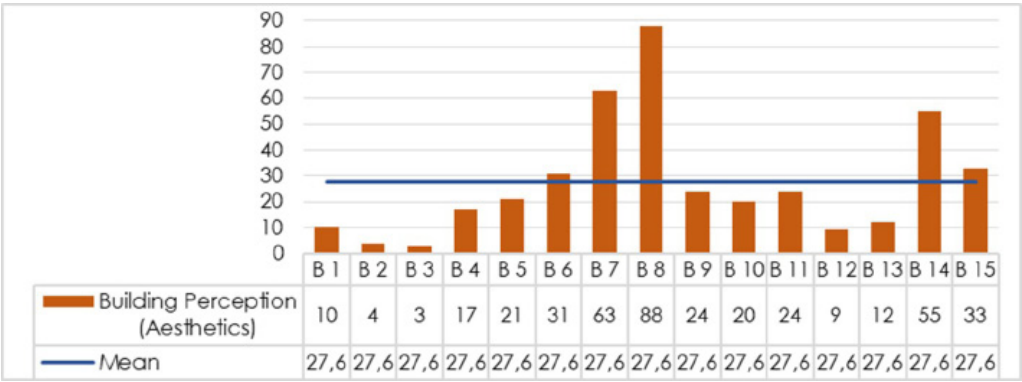
Figure 2. Building awareness



Building perception is explored via aesthetic appeal of the buildings. The pictures of the buildings were presented in a random order, and the participants were asked to select the three they found the most aesthetic. Results showed that B8 (Silahçı Ali Salim Business Building) was selected as the most aesthetic building, B7 (Stock Exchange Palace) and B14 (Tekel Directorate Building) were ranked second and third, respectively (Figure 3). The two most aesthetically pleasing buildings were also those with the highest distinctiveness scores.

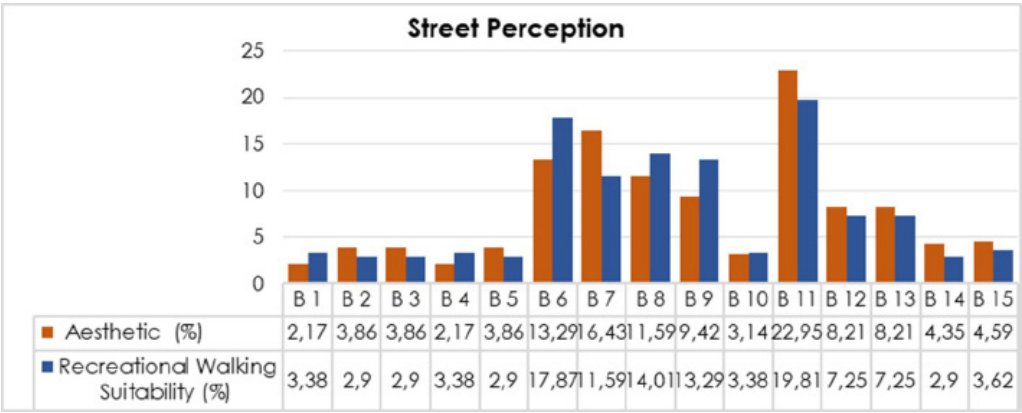
Next, the perceived quality of these streets was evaluated (Figure 4). First, the aesthetic appeal of the streets was measured (similar to evaluations for historical

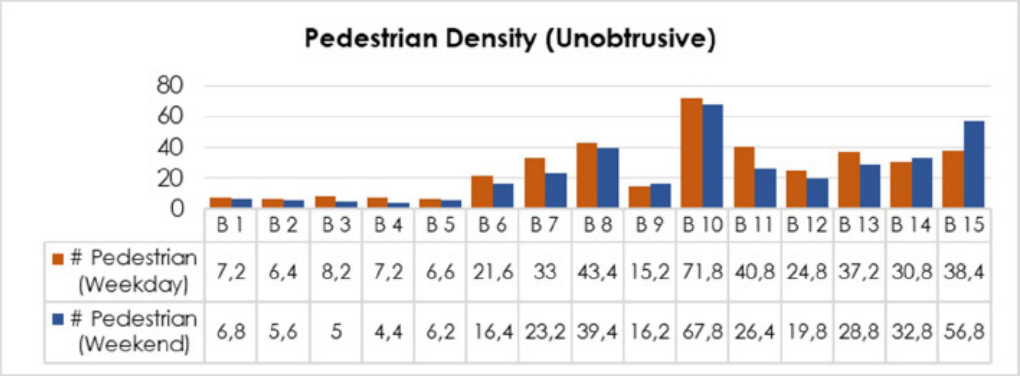
Figure 3. Building perception



buildings). The pictures of the streets were presented in a random order, and the participants were asked to select the three streets they found the most aesthetic. In relation to this question participants were also asked to select the three streets that they consider the most suitable for recreational walking. The results revealed the streets rated as the most visually appealing were also the most preferred streets for recreational walks: B6 (National Theatre Building), B7 (Stock Exchange Palace), B8 (Silahçı Ali Salim Business Building), B9 (Maritime Lines Building), B11 (Necatibey Boulevard No 22).

Figure 4. Street perception





	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15
# Pedestrian (Weekday)	7,2	6,4	8,2	7,2	6,6	21,6	33	43,4	15,2	71,8	40,8	24,8	37,2	30,8	38,4
# Pedestrian (Weekend)	6,8	5,6	5	4,4	6,2	16,4	23,2	39,4	16,2	67,8	26,4	19,8	28,8	32,8	56,8

Figure 5. Pedestrian density – Based on unobtrusive observations

Pedestrian Density Evaluation

The results of pedestrian counting (Figure 5) showed that, except for B9 (Maritime Lines Building), B14 (Tekel Directorate Building) and B15 (Bahçeciler Business Building), the average number of pedestrians was higher on weekdays at all observation points. B9 (Maritime Lines Building) and B14 (Tekel Directorate Building) are located on the access route to Kordon, one of the busiest areas in Izmir on weekends. Additionally, this street segment is adjacent to a small square where facilities such as free Wi-Fi, charging stations, and seating areas are provided. B15 (Bahçeciler Business Building) is located at the transition via one of the pedestrianized streets of Kemeraltı Historical Site and the street leading to Kızlarağası Han, one of the most important places in Kemeraltı.

The results also showed that the street where the B10 (National Library) is located had the highest pedestrian traffic on both weekdays and weekends. As expected, the awareness scores for the B10 (National Library), located at the point with the highest pedestrian density, are also high. However, contrary to expectations, based on building and street perception evaluations, B10 (National Library) is not found to be an appealing building or located on a street considered as aesthetically pleasing or ideal for recreational walking. The National Library's proximity to the most central and popular area in the study (Kemeraltı) may have contributed to this unexpected result. In other words, although its perceived quality scores are not particularly high, the building's central and well-known location in the city may have increased its recognition and the number of pedestrians passing by.

Apart from this, the historical buildings with the next highest pedestrian density are B8 (Silahçı Ali Salim Business Building) and B11 (Necatibey Boulevard No 22). According to street perception evaluations, both buildings are located on aesthetically pleasing streets that are also suitable for recreational walking. For B8, perceived quality scores are among the top three, while for B11 (Necatibey Boulevard No 22), these scores are above average, though not the highest three.

The following Figure 6 and Figure 7 examine "pedestrian density" based participants reports. Participants were asked to rate how often they use the street where the historical building is located, with the following scale: 0= VERY LOW (I don't know the street / have never used it), 1= LOW (I've used the street once), 2= MODERATE (I rarely use the street), 3= HIGH (I frequently use the street), 4= VERY HIGH (I live/work on the street).

The second question asks about the primary reason for walking on the street, offering options such as: I have not walked on this street before / for Recreation (for shopping or leisure) / for Other Purposes (to travel between destinations or

Figure 6. Pedestrian density – Based on survey evaluations

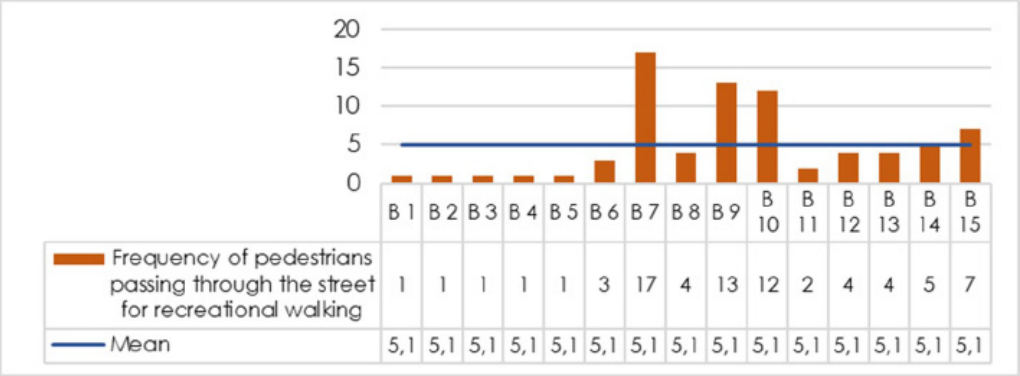
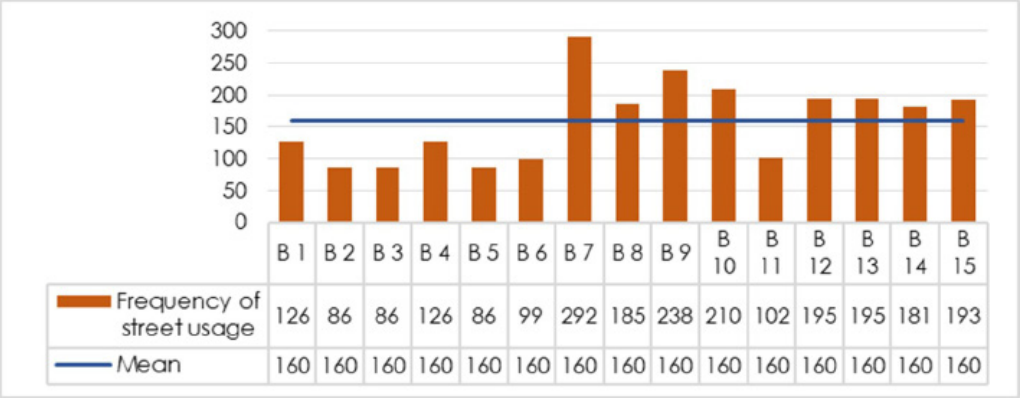


Figure 7. Pedestrian density (recreational walking) – Based on survey evaluations



to Exercise). The results revealed that the most frequently used streets are also popular for recreational walks: B7 (Stock Exchange Palace), B9 (Maritime Lines Building), and B10 (National Library).

Evaluation of the Relationship Between Pedestrian Density, Environmental Perception and Cultural Heritage Awareness

Qualitative and quantitative data analyses are applied in a complementary manner. Correlation analyses were employed to understand the relationship between number of pedestrians and cultural heritage awareness and perception.

According to the findings of this study, the highest "building awareness" score belongs to B8 (Silahçı Ali Salim Business Building) (132), followed by B7 (Stock Exchange Palace) (125) and B6 (National Theatre Building) and B10 (National Library) (122). The street segments where these buildings are located also have high pedestrian counts. It can be inferred that historic buildings located on street segments with high pedestrian counts have a high level of awareness. Likewise, the street segment where the building with the lowest awareness score (B5 (1333 St No 12) = 32) is located has a low pedestrian count.

The relationship between building awareness and building perception is explored. Aesthetically pleasing buildings are more likely to be noticed by pedestrians, and the level of awareness toward such buildings is significantly greater. B8 (Silahçı Ali Salim Business Building) is the most aesthetic building, and it is followed by B7 (Stock Exchange Palace) and B14 (Tekel Directorate Building). The pedestrian density in front of these buildings and building awareness scores are also high, which suggests a link between aesthetic appeal, awareness and pedestrian preferences. In areas where the aesthetic appeal is higher, there are more pedestrians, and awareness increases as well. Similarly, buildings such as B2 (1333 St No 3) and B3 (1333 St No 9) have lower perception (aesthetics) scores and the pedestrian density around these buildings is also quite low.

Although such direct comparisons may provide examples that indicate the accuracy or inaccuracy of assumptions, they are not sufficient for understanding the bigger picture or reaching a comprehensive conclusion. Therefore, Kendall's tau-b correlation analyses were run between building awareness and measures of pedestrian density and perception scores to better understand whether historical building awareness increases when more people pass by it and perceive it as aesthetically pleasing. There is a positive and significant correlation between building awareness scores and all three measures of pedestrian density (average weekday pedestrian counts (r= 0.618, p= 0.001), average weekend pedestrian counts (r= 0.606, p= 0.002) and reported frequency of street usage (r= 0.453, p= 0.022). This indicates that as pedestrian density increases during weekdays and weekends, and as more people think that they pass by the building, the recognition scores of buildings also increase. Although the results did not reveal significant correlation between building awareness scores and street aesthetic scores (r= 0,355, p= 0.072), there is a positive and significant correlation between building awareness scores and building aesthetic scores (r= 0,599, p= 0.002). In other words, people are more likely to remember buildings that have aesthetic appeal.

Kendall's tau-b correlation also revealed a significant and positive relation between weekday and weekend pedestrian counts (r= 0,785, p= 0.00). When the relationship between objective and subjective measures of pedestrian density is examined via Kendall's tau-b correlation; a moderately significant and positive correlation was calculated between the reported "frequency of street usage" and observed weekday pedestrian count (r= 0,412, p= 0.04) and weekend pedestrian counts (r= 0,429, p= 0.03).

DISCUSSION AND CONCLUSION

Understanding the relationship between pedestrian density and cultural heritage awareness is crucial for shaping urban policies that prioritize both walkability and heritage conservation. This study highlights how well-preserved and aesthetically appealing historical buildings are more likely to be recognized and appreciated, especially when located in areas with high pedestrian traffic. The findings suggest that the visual and experiential quality of urban spaces plays a significant role in shaping public awareness and engagement with historical sites. As cities continue to evolve, integrating cultural heritage conservation with pedestrian-oriented urban design can serve as a powerful strategy to enhance both urban livability and historical consciousness.

The results support the notion that increased foot traffic enhances the visibility and recognition of historical structures. Moreover, buildings with high awareness scores tend to be located on streets frequently used for recreational walking, indicating that such environments contribute to the public's recognition and appreciation of cultural heritage buildings.

This correlation underscores the critical role of urban design and aesthetics in fostering cultural heritage awareness. Buildings located in aesthetically pleasing and recreationally walkable streets are more likely to be recognized and valued by the public. The findings suggest that integrating cultural heritage sites into urban planning strategies that prioritize walkability can significantly enhance public awareness and appreciation of these landmarks. Urban planners and policymakers should prioritize the development of walkable urban spaces that highlight historical and cultural landmarks as this approach not only aids in cultural heritage preservation but also enriches the urban experience for both residents and visitors. Encouraging recreational walking in well-designed historic

areas allows people to better observe and experience the city, increasing social interactions and a deeper mental map of the urban environment. This study underscores the need for holistic urban design strategies that balance walkability and heritage conservation, ensuring that historical sites remain not just preserved but actively experienced and appreciated.

In this context, urban design should emphasize aesthetic values, ensuring that the surroundings of historical buildings are enhanced in accordance with urban planning principles. Incorporating art and cultural activities can make these spaces more attractive, drawing more pedestrians and encouraging deeper engagement with the city's historical fabric. To improve visibility and accessibility, historical buildings along walking routes could benefit from better lighting, clear signage, and interactive digital tools, such as QR codes or augmented reality applications, providing visitors with historical insights.

Moreover, a holistic approach that integrates building facades, street textures, and spatial organization can create a more cohesive and immersive urban experience. By carefully designing and improving these environments, pedestrians may be encouraged to explore these areas as flâneurs—urban wanderers who engage with the cultural and historical richness of their surroundings. This enhanced engagement fosters a deeper appreciation of historical sites, ultimately contributing to their long-term preservation.

In brief, "Even if we don't visit or see it, that village (historical cultural heritage) is still ours"; however, "if we do visit and see it, we recognize and appreciate it more".

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Conflict of Interest

No conflict of interest was declared by the authors.

Authors' Contributions

The authors contributed equally to the study.

Financial Disclosure

The authors declared that this study has received no financial support.

Ethics Committee Approval

The present study was ethically approved by the Scientific Research and Publication Ethics Committee, the Faculty of Science and Engineering at Dokuz Eylül University, with the decision dated 08 November 2024 and approval number E-87347630-659-1195864.

Legal Public/Private Permissions:

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions and organizations) during the survey, in-depth interview, focus group interview, observation or experiment.

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